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PROPHECY EFFECTS AND TUTORIAL INSTRUCTION FOR THE DISADVANTAGED CHILD[1]

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Much of the recent interest in the possible effects of expectations on behavior has been generated by one of the most widely-publicized educational experiments of the decade (Rosenthal & Jacobson, 1968). Although systematic inquiry into expectancy effects in education is a relatively recent development, relevant observations have been reported by a number of writers (see Rosenthal, in press; Rosenthal & Jacobsen, 1968). The fundamental concept underlying much of the work in this area is that of the "interpersonal self-fulfilling prophecy" -- the tendency for one individual's expectations and/or predictions about another person's behavior to be realized. Implicit in the traditional formulations of this idea (Allport, 1950; Merton, 1948) is the assumption that the expectation or prophecy somehow affects the behavior of the prophet in such a way as to make the prophesied event more likely.

In discussions of the anecdotal and empirical literature on prophecy effects (Rosenthal, in press; Rosenthal & Jacobsen, 1968), the overwhelming majority of the available evidence is found to support the expectancy hypothesis. Perhaps most familiar to psychologists are those studies indicating experimenter bias in psychological research (see Rosenthal, 1966, 1967). There is little doubt that this type of research, although itself the object of considerable controversy (Barber et al. 1969; Barber & Silver, 1968a, b; Rosenthal, 1968), has stimulated a new kind of methodological self-consciousness among behavioral scientists. Apart from purely methodological considerations, however,

the more general implications of the expectancy principle for contemporary social problems have attracted attention. Along these lines, a focal issue has been that of education for the economically-disadvantaged child.

The positive association between socio-economic status and school achievement is a well-documented empirical fact (e.g., Charters, 1963; Stodolsky & Lesser, 1967). Acknowledgment of this social reality has given impetus to the development of a number of experimental programs, many of which have been funded under Title I of the Elementary and Secondary Education Act. As Rosenthal and Jacobsen (1968, pp. 50-51) have pointed out, however, most of these compensatory educational programs have attempted to deal with the problem by acting on the child -- through remedial reading, counseling and guidance, cultural experiences, etc. Such an approach they argue, presumes that the achievement failure of lower class youngsters is due solely to some sort of deficiency characteristic of the child or of his subculture. But the question which arises in connection with the study of prophecy effects is just this: To what extent might the achievement failure of lower class children be attributable to teacher variables such as attitudes toward and perceptions of the disadvantaged child? In point of fact, Clark's description of the economically-deprived child as "...the victim of an educational self-fulfilling prophecy" (1963, p. 5) receives some indirect support from studies showing that teachers and administrators expect less from lower-class children (Becker, 1952).

The experiment conducted by Rosenthal and Jacobson (1968) was based on the premise that "one person's prophecy of another's intellectual performance can come to determine that other's intellectual performance"(p. 31).

Their results showed that a randomly chosen group of children, of whom teachers were led to expect marked intellectual growth, achieved significantly greater IQ gains than did control subjects. Although the dynamics of the phenomenon are by no means clear, recent research has suggested some provocative leads. Rothbart, Dalfen, and Barrett (1971), for example, have found that teachers spend more time attending to students arbitrarily designated as the "better" ones.

To be constrasted with the rather uncritical acclaim accorded Rosenthal and Jacobson's (1968) experiment by popular press sources like Time (September 20, 1968, p. 62) and the Saturday Review (October 19, 1968), reviews by psychologists have been less than unanimously laudatory. Both Thorndike (1968) and Snow (1969) have raised serious questions about the legitimacy of the inferences drawn from that study. These critiques focus on two main points. First, analyses in the now famous experiment were performed on IQ's derived from raw scores obtained with the Tests of General Ability (TOGA), chosen partly because it would probably be unfamiliar to teachers. Thorndike (1968) and Snow (1969), however, point up the inadequacy of the TOGA IQ norms for the youngest children tested -- those for whom the reported prophecy effect was shown most clearly. Second, the reviewers call attention to the fact that the difference in mean gain between experimental and control groups was essentially zero for all grades except the first two. Indeed, the failures to confirm the self-fulfilling prophecy hypothesis in more recent educational experiments (Claiborn, 1969; Fleming & Anttonen, 1971) lend support to the cautions urged by Thorndike and Snow.

Rosenthal's (1969, 1970) replies to the critics have emphasized acknowledgement of the merits of his and Jacobson's study by well-known writers like Ullman (1969) who suggested that it be used as a model in courses dealing with

research methodology and procedures, as well as Division 13 of the APA which awarded it the Cattell Fund Award. Beyond this, in order to show that the expectation effect did not depend completely upon inclusion of the particular classrooms singled out by the reviewers, Rosenthal points out that fully 15 of 17 classrooms showed greater gains among the children alleged to be spurters.

A methodological issue which was not elaborated in either of the critiques mentioned above is the fact that all testing in the Rosenthal and Jacobson (1968) experiment was done by the classroom teachers themselves. Moreover, prior to administering the pre-test, the teachers were told: (a) that a National Science Foundation sponsored research project was to be carried out in their school; (b) that a test with the impressive enough title of the the "Harvard Test of Inflected Acquisition" was to be used to predict which youngsters would be most likely to show an academic spurt; and (c) the scheduled dates of re-testing (Rosenthal & Jacobson, 1968, p. 66). This prior information might well have created a set of demand characteristics which predisposed teachers to take full advantage of the opportunity provided by the pre-test to familiarize themselves with the content of the criterion measures. Aside from their role in facilitating the "success" of the research project, how would it look for the teachers of predicted spurters who failed to spurt? In short, the possibility arises that the obtained expectancy effects may have been mediated, in part, by intentional or unintentional selective coaching-to-the-test of the designated pupils by their teachers.

As a matter of fact, Rosenthal and Jacobson (1968, p. 153) considered the possible biasing of their results by the administration of the test by the classroom teachers. To determine whether the observed expectancy advantages were dependent upon the teachers' behavior during the administration of the post-tests, three classrooms were re-tested by a "blind" examiner.

However, since comparisons were not conducted with "blind" examiners administering the pre-test, the possibility of selective coaching went unchecked.

There is some indirect evidence, however, to contraindicate selective coaching in the Rosenthal and Jacobson experiment. The authors point out that there was considerably more teacher-pupil interaction during administration of the verbal than of the reasoning subtest of the TOGA (Rosenthal & Jacobson, 1968, p. 68). In contrast to what might be predicted from the selective coaching hypothesis, expectancy effects were shown much more clearly on the reasoning than on the verbal subtest with which teachers had the opportunity for more extensive familiarization. Nonetheless, the possibility of selective coaching cannot be ruled out since the opportunity for teachers to familiarize themselves with both subtests was considerable, and since no control for this variable was included.

Speculations about previous work aside, the present study extends the investigation of expectancy effects to a tutorial program for economically-disadvantaged children. In view of the proliferation of such programs throughout the country, it would be of interest to know the extent to which tutorial success in these situations may be influenced by prophecy effects of the kind described above. As in Rosenthal and Jacobson's study, manipulation of expectations was attempted by giving tutors spurious information, allegedly based on testing, as to current and expected intellectual functioning of their pupil.

In addition to the differences in the nature of the instructional situation, the present study differs from Rosenthal and Jacobson's in three main respects. First, unlike the earlier experiment in which only the effects

of raised expectations were investigated, in an effort to provide a more thorough evaluation of the phenomenon as it may occur in everyday life, this study explores the effects of three ascribed levels of predicted functioning: high, average, and low. Second, the possible operation of coaching-to-the-test effects in studies of this nature was tested here by evaluating performance differences between children whose tutors did and did not have familiarity with the criterion measures. Third, in place of the TOGA, more or less traditional measures of verbal intelligence and reasoning ability were used.

Method

Children and Tutors

Child-tutor pairs in the study were obtained from an experimental enrichment program called Operation SHARE, administered through the Santa Clara County (California) Office of Education. SHARE, which is funded under Title III of the Elementary and Secondary Education Act, provides volunteer college student tutors for children referred by their parents and teachers for individual instruction. Many of these children are failing or nearly failing in all academic areas. Between 70-80% of the children tutored through SHARE are Mexican-Americans, almost all of whom are from low-income families, many of which are receiving welfare payments. Each student volunteer is assigned only one pupil with the understanding that tutors are expected to devote at least two hours per week to the child with whom they have been paired. Tutorial assignments are made by SHARE coordinators on a random basis except that the tutor is allowed to choose from among several children in his locale.

During the Fall semester, 1969, the program director generously authorized a portion of one SHARE district for this study. The experimental sample was comprised of forty-four elementary school youngsters (34 males, 10 females) and their tutors. Judging from the homogeneity of real estate values in their home neighborhoods, it is fair to say that the children were from roughly the same socio-economic background.

Procedure

Prior to the first meeting with their tutor, all of the children were pre-tested individually at school by paid assistants completely naive as to the actual purposes of the testing. In order to maintain some degree of continuity with the earlier experiment and yet avoid possible ambiguities arising from the use of unfamiliar instruments, two relatively well-established measures of verbal intelligence and reasoning ability were required. The Peabody Picture Vocabulary Test (PPVT) and the Similarities subtest from the Wechsler Intelligence Scale for Children (WISC) were used for these reasons.

Child-tutor pairs were assigned at random to one of the four treatment conditions described below, with the restriction that age be approximately equated across groups. The four groups differed only in the nature of the information given to the child's tutor. The information was supplied by the experimenter (E) in personal meetings with each of the tutors. Such meetings between coordinators and tutors are routine in SHARE and are designed to help familiarise tutors with the child's background.

The tutors of children in Group I, the High expectation condition, were instructed as follows:

> _____, the child you will be tutoring this semester, has been given a battery of special intelligence tests as part of an evaluation of Operation SHARE and he (she) was found to be of very high intelligence. Although it is not possible to specify exactly his (her) IQ score, it falls within the 120-129 range. This indicates that no matter how he (she) is doing right now, he (she) will probably make some rather dramatic gains in academic areas within the next few months. So it seems that you'll be tutoring a child who may exhibit something of a spurt in school.

Group II was the High expectation-- Test Familiarity (TF) condition. Tutors of children assigned to this group were given the same instructions as were those in Group I, but were also familiarized with the tests. This was achieved by showing tutors the test materials and demonstrating for them several sample items from each test.

With Group III tutors the child's IQ was said to be Average, "...within the 95-105 range." Group IV tutors were told that the child's IQ was found to be Below Average, "...within the 85-95 range." The E suggested to the tutors in the latter two groups that they could expect the child to be working at a level corresponding to his intelligence classification on the "special" test battery throughout the tutoring period. There was no mention of spurting nor familiarization of tutors with the test materials in Groups III and IV.

After the appropriate induction had been given, all tutors were instructed as follows:

> It is very important that this information about _____'s performance on these tests be kept strictly confidential between SHARE and you. This is privileged information, for the time being at least, and should not be discussed either with _____'s parents or his (her) teacher. He (she) will be tested again with the same tests later in the year and you'll be informed of the results.

After approximately seventeen weeks of tutoring, all of the children were re-tested by the paid assistants with the PPVT and WISC Similarities subtest. Following the post-test, tutors were contacted in order to explain to them the purposes of and manipulations in the experiment.

Results

The random assignment of child-tutor pairs to conditions resulted in four groups which were reasonably homogeneous with respect to the sex distribution of the children tutored. Groups I, II, and IV each included 8 male and 3 female youngsters, with 10 males and 1 female in Group III. Sex differences between the groups were not tested in the analyses reported below in view of the very small and unequal female n's.

As shown in Table 1, the mean ages of the children in the four groups were quite closely comparable. A one-way analysis of variance revealed no significant age differences between the groups.

Pre-test, post-test, and gain score means and standard deviations for all four groups are summarized for the PPVT and Similarities measures in Tables 2 and 3, respectively. Raw scores have been used throughout. Preliminary analyses of variance were performed on pre-test scores to provide a statistical estimate of initial comparability of the groups. These analyses showed no significant differences between the groups on either the PPVT or the WISC Similarities.

The effects of the experimental manipulation were tested with one-way analyses of variance on the gains achieved over the seventeen week tutoring period by the children in each group. These analyses indicated significant differences ($F = 3.53$, $df = 3/40$, $p < .025$) between the four groups on the PPVT but not on the WISC Similarities.

Duncan's multiple range tests were used to compare group mean PPVT gain scores. As shown in Table 4, these tests indicated significantly greater gains by children in the test familiarity condition than by children in all of the other groups. There were no other significant differences between the groups.[3]

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Discussion

In short, there were no significant differences between the groups on the WISC Similarities. Moreover, the only significant differences on the PPVT suggest that the attribution of a high level of intellectual functioning, combined with prophesied spurting, resulted in greater gains than the other conditions only when tutors were also familiarized with the criterion measures before beginning their tutorial assignments. Otherwise, differences in the designated level of functioning made no difference in the gains achieved by children over the course of tutoring. Not even the gain score differences between the extremes of the induction variable, groups allegedly High vs. Low in IQ, were significant.

Disregarding the test familiarity condition, the relationship between the magnitude of the gain achieved and level of functioning ascribed to children in a group was not linear. On both measures the greatest gain was achieved by children said to have a High IQ, but the next highest gain was achieved by children reported to have a Low IQ, with the smallest gains occurring among children in the Average group. These comparisons, of course, are of dubious value since none of the mean differences between these three groups were significant.

Differences in level of functioning attributed to and predicted for a child apparently failed to affect either expectations and/or behaviors of tutors in any way that could affect their pupil's intellectual growth. Although none of them provides a completely satisfactory interpretation of these data, each of the following speculative explanations deserves consideration.

Let us deal first with the failure to find significant differences between groups independent of tutors' familiarity with the tests. To begin with, it is possible that the number of SHARE contact hours was insufficient to allow for the experimentally-induced differences in tutors' expectations to manifest themselves in performance differences between the children tested. To be sure, the standard SHARE tutoring period is only seventeen weeks as compared with the eight months which intervened between pre- and post-testing in Rosenthal and Jacobson's (1968) study. The issue is an empirical one, but it is doubtful that our results would have been substantially different from those reported above regardless of how much longer the tutoring period had been. There is some indirect support for this conclusion from preliminary data, discussed by Rosenthal and Jacobson (1968, p. 145), indicating that teacher expectations can affect a child's intellectual performance in as short a time as two months.

A more likely possibility is that there was such a high degree of uniformity among these volunteer tutors in their attitudes toward their pupils and motivation for success that the attempted experimental induction was largely irrelevant to them. It must be remembered that all tutors came into the situation with the understanding that they were going to be working with a child who had been referred for individual help because he was

failing or doing very poorly in school. So the description of the pupil population to prospective tutors in SHARE recruitment drives may have been a much more powerful determinant of expectations than anything the tutors were told by the experimenter in this study.

The principal finding of the study, however, was the association between tutors' familiarity with the test materials and greater test score gains by their pupils. It is quite possible that exposure of tutors to such information may have predisposed them, intentionally or unintentionally, to engage in some degree of selective coaching of their pupils. Support for this interpretation comes from the fact that although the test familiarity condition was superior to all others on the PPVT, no such differences occurred on the Similarities measure. This may have been the case because picture identification is a somewhat more discrete and thus more readily teachable skill than the more complex kind of reasoning required in the WISC subtest. From this point of view, the issue becomes one of determining the extent to which such selective coaching results in a functional as opposed to a spurious growth in measured intelligence. In other words, does the increase in test scores in such cases reflect a "true" (Ghiselli, 1964, Ch. 8) gain, or does the selective coaching simply contribute error variance to the estimate of the individual's intelligence?

The answer to the question posed above depends upon a determination of just how specific to the particular test is the selective coaching, if any, which occurs. After all, tasks of a given type are included in measures of intelligence because they are assumed to demand the exercise of a given type of ability. To the extent then, that selective coaching results in practice of a particular type of intellectual skill, it may have generally beneficial effects.

When the effects of test familiarity are considered with respect to the instructional situation within which the experiment was conducted, another possibility arises. With the exception of a few general orientation meetings, SHARE offers no in-service training for volunteer tutors. For the most part, the tutor is on his own. Given this fact, the test familiarity condition may have provided these enthusiastic but inexperienced volunteers with some very helpful guidelines as to the particular types of things to try to teach. It is also possible that the nature of the instructional situation, at least in volunteer community programs like the one studied here, may induce a degree of uniformity of motives and attitudes sufficient to obscure the effects of allegedly official psychometric information. But the major empirical issue raised by the study concerns the apparent increase in tutorial success in the test familiarity condition. In addition to a test of the authenticity of such gains, it would be of interest to determine whether the effect is contingent upon the prediction of a high level of performance or whether it obtains regardless of the level of functioning predicted for the child.

In conclusion, the results of the study failed to support the general utility of attempted manipulations of expectations as a means of enhancing intellectual growth in children. More importantly, the results suggest that prophecy effects in studies of this kind may be an artifact of a methodology which confounds attempts to induce different levels of expectation with teacher familiarity with the criterion instruments. In this regard, it is interesting to note that in at least one of the notable failures to replicate the Pygmalion phenomenon in a classroom situation (Fleming & Antonnen, 1971), tests were administered by experimental assistants and not by the teachers. In short, despite the intuitive appeal of the expectancy hypothesis, it appears that teacher familiarity with the measures employed may constitute a non-negligible contribution to the fulfillment of the prophecy.

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Footnotes

1. This research was supported by a grant to the first author from the Center for Research and Advanced Studies at San Jose State College.

2. Requests for reprints should be sent to Robert J. Pellegrini, Department of Psychology, San Jose State College, San Jose, California, 95114.

3. Close examination of the data might lead the reader to suspect heterogeneity of the PPVT gain score variances. In fact, computation of Hartley's statistic indicated significant heterogeneity of the variances between groups on this measure (F_{max} = 7.83, df = 10, $p < .05$). A supplementary non-parametric analysis using Mann-Whitney U comparisons, however, yielded essentially the same results as those described above except that the difference between the High--TF and Average expectation conditions reached significance only at $p < .05$ and not at $p < .01$ as was the case when Duncan's test was applied.

Table 1

Mean Ages and Standard Deviations

of Children in the Four Groups

Group	Mean	SD
I (High)	8 Yrs. 10 Months	1 Yr. 4 Months
II (High--TF)	9 Yrs. 1 Month	1 Yr. 4 Months
III (Average)	9 Yrs. 3 Months	1 Yr. 9 Months
IV (Low)	9 Yrs. 1 Month	1 Yr. 7 Months

Table 2

Group Means and Standard Deviations for

PPVT Pre-Test, Post-Test and Gain Scores

Group	Pre-Test	Post-Test	Gain
I (High)			
Mean	69.91	71.73	1.82
SD	12.45	13.00	3.57
II (High--TF)			
Mean	70.18	76.91	6.73
SD	11.97	15.23	7.39
III (Average)			
Mean	72.54	72.55	0.01
SD	12.55	12.14	6.24
IV (Low)			
Mean	72.64	73.45	0.81
SD	11.55	11.01	2.64

Table 3

Group Means and Standard Deviations for

WISC Similarities Pre-Test, Post-Test and Gain Scores

Group	Pre-Test	Post-Test	Gain
I (High)			
Mean	6.91	9.55	2.64
SD	2.84	3.18	2.06
II (High--TF)			
Mean	8.00	10.45	2.45
SD	3.71	3.56	3.62
III (Average)			
Mean	8.00	8.64	.64
SD	3.32	4.38	2.87
IV (Low)			
Mean	8.54	9.73	1.19
SD	2.98	2.97	2.32

Table 4

Summary of Duncan Range Tests on Differences

Between Expectation Conditions in PPVT Gain Scores

Group	Mean	Comparison			
		I	II	III	IV
I (High)	1.82		*	ns	ns
II (High--TF)	6.73			**	*
III (Average)	.01				ns
IV (Low)	.81				

* $p < .05$

** $p < .01$